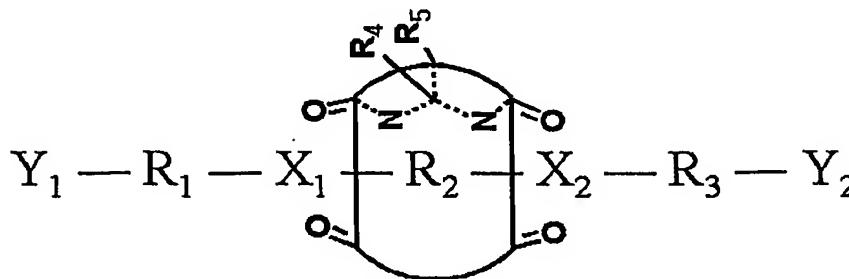


CLAIMS

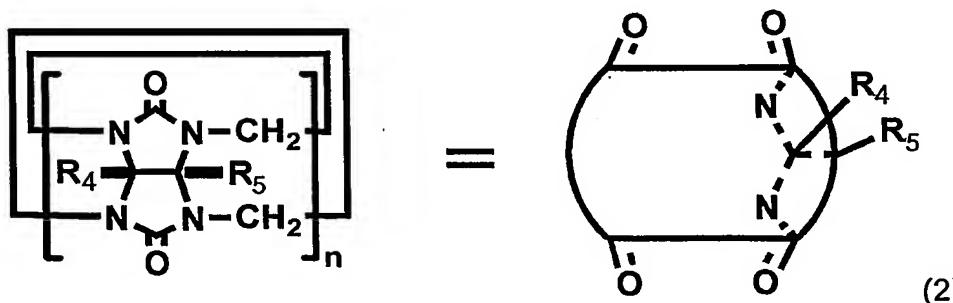
1. A compound represented by Formula 1 below in which a compound of Formula 3 below vertically passes through a cavity of cucurbituril or its derivative of Formula 2 below:



(1)

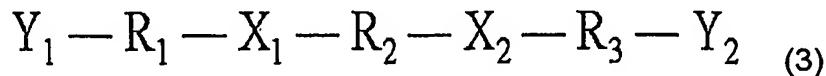
wherein R₁, R₂, and R₃ are each independently saturated or unsaturated linear C₂-C₁₀ alkylene, ethyleneglycol oligomer, 1,4-substituted benzene, or 1,4-substituted pyridine; X₁ and X₂ are each independently a positively charged functional group for ion-dipole interaction with an oxygen atom of cucurbituril or its derivative of Formula 2;

10 Y₁ is a functional group for a linkage with a biomaterial comprising a gene or a protein; and Y₂ is a functional group for a linkage with a solid substrate,



(2)

wherein n is an integer of 4 to 20; and R₄ and R₅ are each independently hydrogen, an alkenyloxy group with an unsaturated bond end and a substituted or unsubstituted alkyl moiety of C₁-C₂₀, a carboxyalkylsulfinyloxy group with a substituted or unsubstituted alkyl moiety of C₁-C₂₀, a carboxyalkyloxy group with a substituted or unsubstituted alkyl moiety of C₂-C₈, an aminoalkyloxy group with a substituted or unsubstituted alkyl moiety of C₂-C₈, or a hydroxyalkyloxy group with a substituted or unsubstituted alkyl moiety of C₂-C₈, and

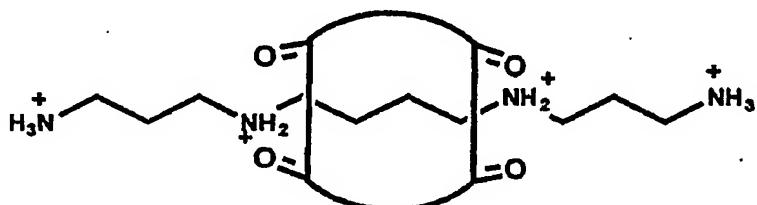


wherein R₁, R₂, R₃, X₁, X₂, Y₁, and Y₂ are as defined in Formula 1 above.

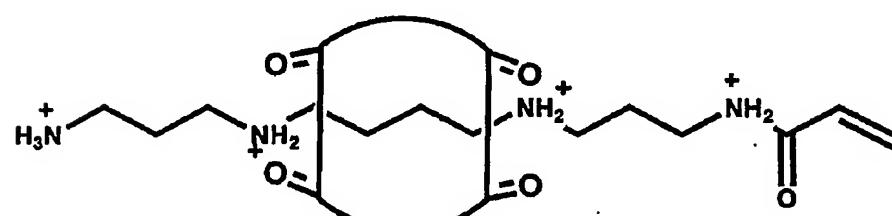
20

2. The compound of claim 1, wherein X_1 and X_2 are each independently secondary ammonium, 1,4-substituted pyridinum, or benzyl ammonium; and Y_1 and Y_2 are each independently a primary amine group, an amide group, an acrylamine group, an alkylester group, an aldehyde group, a carboxyl group, an alkoxy silane group, a halogenated acyl group, a hydroxyl group, a thiol group, a halogen group, a cyan group, an isocyan group, or an isothiocyan group.

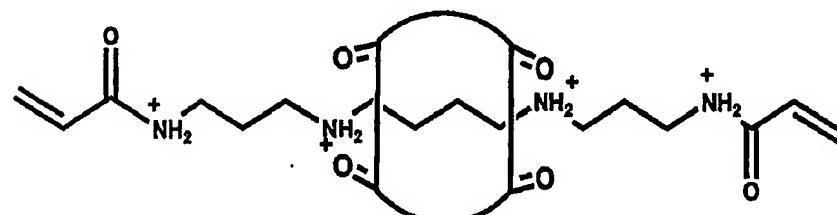
5 3. The compound of claim 1, which is selected from the group consisting of compounds represented by Formulae 5 through 13:



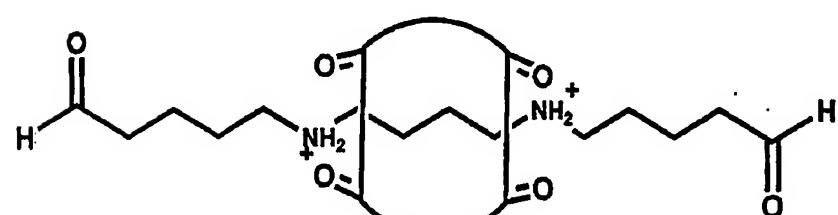
(5)



(6)



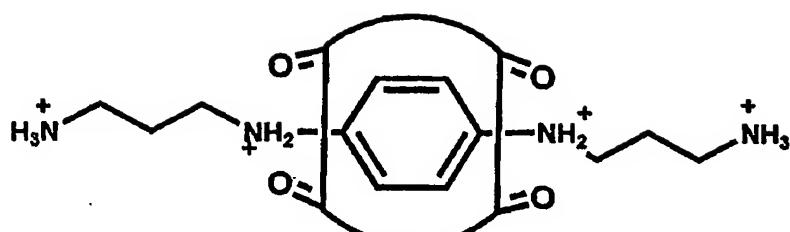
(7)



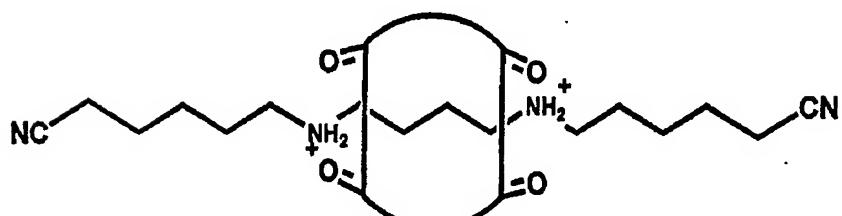
(8)

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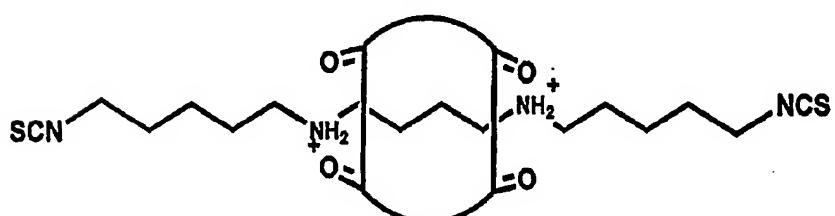


(9)

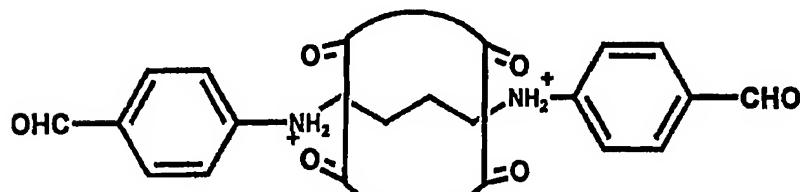


(10)

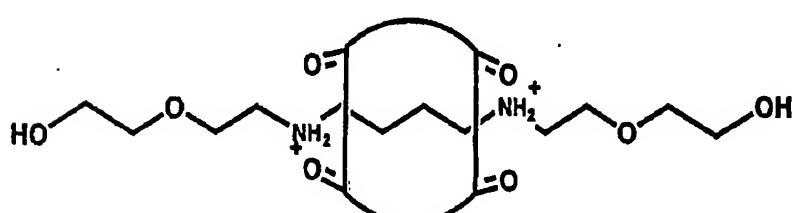
5



(11)



(12)



(13)

10

4. A solid substrate bonded with a compound of Formula 1 via a covalent

bond or a non-covalent bond.

5 5. The solid substrate of claim 4, wherein the compound of Formula 1 is present in a density of 0.05 to 0.6 compounds/nm².

6 6. The solid substrate of claim 4, which is a glass, a silicon wafer, an indium tin oxide (ITO) glass, an aluminum oxide substrate, or a titanium dioxide substrate.

10 7. A gene chip comprising the solid substrate of any one of claims 4 through 6.

8. A protein chip comprising the solid substrate of any one of claims 4 through 6.

15 9. A sensor for biomaterial assay comprising the solid substrate of any one of claims 4 through 6.